

11-3 Geometric Sequences

-sequence in which each term after the first is found by multiplying the previous term by a constant (common ratio)

ex:

3, 12, 48, ...

$$r = \underline{4}$$

$$r = \frac{12}{3}$$

ex:

100, 20, 4, ...

$$r = \underline{\frac{1}{5}}$$

$$\frac{20}{100} = \frac{1}{5}$$

ex:

2, 6, 18, 54...

$$r = \underline{3}$$

Develop the formula.

$$a_2 = 2 \cdot 3 = 6$$

$$a_3 = 2 \cdot 3^2 =$$

$$a_4 = 2 \cdot 3^3$$

To find the nth term:

$$a_n = a_1 \cdot r^{n-1}$$

ex:

3, 9, 27, ...

Find a_7

$$a_7 = 3 \cdot 3^6$$

$$2187$$

ex:

100, 25, 6.25, ...

Find a_5

$$r = \frac{1}{4}$$

$$a_5 = 100 \left(\frac{1}{4} \right)^4$$

$$= \frac{25}{64}$$

ex:

Write an equation for a_n

5, 10, 20, 40, ...

$$a_n = a_1 \cdot r^{n-1}$$

$$a_n = 5(2)^{n-1}$$

ex:

 $a_7 = \underline{\hspace{2cm}}$ $a_3 = 96$ $r = 2$

$$a_7 = 96 \cdot 2^4$$

$$\underline{1536}$$

$$r^{n-1}$$

Geometric Means--terms between two given terms

ex:

Find three geometric means between 300 and $\frac{6075}{64}$

$$300 \quad \frac{225}{4} \quad \frac{675}{16} \quad \frac{2025}{64} \quad \frac{6075}{64}$$

$$\frac{6075}{64} = 300 r^4$$

$$\left(\frac{81}{256} \right)^{\frac{1}{4}} = (r^4)^{\frac{1}{4}}$$

$$\underline{\frac{3}{4}} = r$$

DO:

Find three geometric means between -3 and -12,288

HW

p591

15, 17, 21, 23, 31- 39odd, 38, 43, 45